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ABSTRACT

A followup study conducted in 19 high schools throughout Oregon involved 1,296 early leavers and graduates of the class of 1981. Both vocational education and nonvocational students participated. Data came from three sources--surveys of former students, transcripts and permanent files of these students, and program rating data from vocational instructors who taught in 1981. Findings showed 66 percent of the vocational education and 62 percent of the nonvocational graudates were working and 30 percent of the vocational and 41 percent of the nonvocational graduates were enrolled in school. Over 90 percent were satisfied with their present job. Seventy-six percent of the vocational graduates and 78 percent of the nonvocational had attended postsecondary schools. Students enrolled in postsecondary education most frequently to receive a degree, obtain a broad education, and obtain or improve job-related skills. A third of the students recommended requiring three years of math for high school graduation; 20 percent recommended a three-year science requirement. Over half wished they had taken more math; 38 percent of both groups wished they had taken more science. Vocational courses were perceived as useful by both "vocational cluster students" and nonvocational students who took them. (YLB)

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VIEWS THREE YEARS LATER:
RESULTS OF A STATEWIDE HIGH SCHOOL FOLLOW-UP STUDY

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VIEWS THREE YEARS LATER: RESULTS OF A STATEWIDE HIGH SCHOOL FOLLOW-UP STUDY

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Providing direction for improving secondary education involves an understanding not only of what is currently occurring but also of the relevance of these experiences to the lives of young people after they have left high school. This presentation reports on a high school follow-up study conducted in 19 high schools throughout Oregon that involved 1,296 early leavers and graduates of the class of 1981. Both vocational education and nonvocational students participated.

This study focused on some key outcomes of secondary vocational education identified by the National Center for Research in Vocational Education (Darcy, 1980) following their review of the related literature (Taylor, Darcy and Bolland, 1979), and more recent empirical outcomes (McCaslin, 1982). It also used a perspective for identifying key elements of vocational programs the research literature on secondary school effectiveness (Owens and Crohn, 1984) and vocational program standards collected from a number of states. The analysis of data by level of intensity of student participation in vocational education was based on the conceptual framework developed by Paul Campbell and colleagues at the National Center for Research in Vocational Education (Campbell, Orth and Seitz, 1981).

Prior to this spring 1984 study, the Northwest Regional Educational Laboratory (NWREL) had developed a comprehensive model for assessing vocational education in Oregon (Owens, 1981). This model builds upon existing evaluation data in the state as well as new data to be collected from high school students, staff, parents, employers, advisory councils and former high school students contacted three years after leaving school. Such information is essential for helping to identify strengths and weaknesses in the high school experience and for suggesting areas for improvement. This study was designed so that individual school data (and district data in the case of Portland, Salem and Springfield) would be reported by NWREL to local staff for their use in preparing reports to their local school boards, while the aggregated state data could be used by the Department of Education and others for providing new insights into secondary vocational education within the state.

Purpose

The purposes of this study were to: (1) determine the adequacy of secondary vocational and nonvocational programs in preparing individuals for employment and/or continuity education, (2) describe former students' current activities and the extent to which they were related to their high school experiences, (3) identify reasons given for attending postsecondary education, and (4) examine reactions of former students to increased high school graduation requirements in science and mathematics. A secondary purpose of the study was to determine the impact of secondary vocational education depending on the pattern of a student's participation in vocational education.

Method

Sample

Schools participating in this study were selected from those who operated state-approved vocational programs. Schools were selected so as to provide a proportional balance of small (less than 900 students enrolle), medium (900-1500 students) and large (over 1500 students) and to represent all five geographic regions of the state. A good balance of four large, ten medium and five small high schools was achieved. The coastal area and central and eastern sections of the state were somewhat underrepresented due to the fact that several schools from these areas that were originally recruited to participate later declined. Within each school, the design called for surveying all former vocational students who were listed on the state SERVE report and a random sample of 30, 60 or 90 nonvocational students depending on whether the school was listed as small, medium or large.

Instrumentation and Procedures

The High School Follow-up Survey developed for this project was a 42-item form designed to be used as a mailed questionnaire or as a telephone interview. In addition to the items asked of all students, several schools identified three or four unique questions asked only of their students. The common questions covered the former students' occupational status; relevance of high school training to a current job or educational program; career goals and factors influencing them; types of education beyond high school; types of vocational courses studied in high school and reasons for taking vocational education; relationship between their vocational program and their current job or educational studies; assessment of characteristics of the high school vocational program; attitudes toward increased high school science and math graduation requirements; and assessment of these areas of their high school experience.

A Transcript/SERVE Report form was completed on each former student by the school secretary or other appointed person. The SERVE report contains data on vocational cluster students that is submitted to the state department of education. The data collection form records the attendance records for junior and senior year; grades and credits received in specific vocational cluster areas in sophomore, junior and senior years; number of math and sciences courses taken by type of course; math and science grades; and student's sex. For vocational cluster students, additional information was recorded about the cluster studied, whether the student participated in cooperative work experience and/or various vocational student organizations, any handicap the student may have had and the student's race.

The student survey was designed to cover areas identified in the project proposal. The initial draft, deliberately long, was distributed to coordinators from the participating schools and the Oregon Department of Education. A meeting was held to review the draft, determine which were considered the more important items and identify changes needed in any items.

A revised and shortened survey was prepared and pilot-tested with young adults in the Portland Metropolitan area. The revised instrument and student transcript/SERVE form were used in training sessions held in three areas of the state with data collectors. The instruments were again revised for final printing by NWREL and distribution to the participating schools. The NWREL staff also provided consultation to schools by telephone during the actual data collection phase.

Data Collection

The data for this study came from three sources-- (1) surveys of former students who graduated or left school in 1981, (2) transcripts and permanent files of these students, and (3) program rating data from vocational instructors who taught in 1981. (The vocational instructor data are not reported in this paper.) Student data were collected either through mail survey or telephone interviews with former vocational students and a random sample of and nonvocational students by secretaries in the 19 participating schools. The Education and Work staff at NWREL developed the study and pilot-tested the follow-up instruments, trained the school data collectors, conducted the data entry and analysis, reported statewide results and provided technical assistance to the participating schools in reporting their findings.

Of the 1296 former students, 672 had taken at least one year of vocational cluster courses. The remainder were identified as nonvocational students although many had taken one or more vocational education classes. Oregon does not distinguish between academic and general program students. Females comprised 53 percent of the former voctional education students and 45 percent of the nonvocational stduents.

In addition to the instruments, NWREL developed a detailed eighteen-page data collector's guide and a six-page data coordinator's guide. These guides covered directions for selecting students, suggestions for locating and contacting students, a student contact log, mail survey procedures, draft cover letter for local principals, directions for telephone interviewing and suggestions for handling special problems that might arise. These detailed materials, plus the several-hour data collector training sessions including simulated telephone interviews, helped assure standardization of procedures across the 19 schools and increased reliability of the findings.

The coding of open-ended items on the questionnaire and course credits on the transcript was performed by two NWREL staff under the direction of Dr. Owens. After initial practice and discussion of problem areas, a 92 percent agreement on coding was reached by the two coders.

Study Limitations

Although the majority of planning, coordination and data collection activities involving NWREL and the 19 participating schools went smoothly, this study, like any other, encountered some difficulties. The initial design called for collecting follow-up data both from high school

graduates and from early leavers (those who left school before their expected graduation date). Despite efforts to locate records and addresses of early leavers, six high schools did not include data from this group, and across the 19 schools only 42 early leavers completed surveys. The small number of early leavers reporting information led us to exclude reporting analyses on that group in this paper. A second limitation was the low return rate from mailed surveys to former students, despite a follow-up postcard and second mailing of the survey to students. The response rates ranged from 25 percent to 90 percent across the 19 schools. It averaged 30 percent statewide. Because of staff turnover, some schools did not attempt to reach former students until the summer, often a difficult time of year to reach people. Other problems included the inability to locate current addresses or telephone numbers for some former students. A few schools decided to use only telephone interviews to collect the data rather than using mailed surveys and this generally proved more effective.

Reports from three participating schools indicated that the SERVE report data received from the Oregon Department of Education contained incorrect information about students' race; therefore, we did not include such data in the report.

Analysis

The returned questionnaires were coded and data entered into a CDC computer using the Statistical Packages for the Social Sciences (SPSS) (Nie, 1979). Much of the data were summarized in the form of tabulated or cross-tabulated frequencies and percentages. Analysis of variance and multiple analysis of variance were also run. The Report Writer program was used to formulate tables for direct use in the school, district and state reports and a new process was created to inferface the SPSS data with the NWREL Wang word processing system which was handy for editing tables.

In analyzing patterns of participation by the high school vocational education population, procedures established by researchers at the National Center for Research in Vocational Education (NCRVE) at the Ohio State University (Campbell, Orth and Seitz, 1981) were followed. The NCRVE researchers developed patterns of participation based on five scores: intensity, diversity, continuity, supportive diversity and proximity. These five concepts are based on a theoretical framework developed at NCRVE.

The intensity score is the number of Carnegie credits in a vocational specialty in which at least .6 of the total vocational credits were earned. Of the 634 vocational students whose transcripts were analyzed, 37 percent did not have a dominant specialty that accounted for .6 or more of their total vocational credits. Fifteen percent had a score of 1, 18 percent a score of 2, 10 percent a 3, 13 percent a 4, four percent a 5, and four percent a score of 6 to 9.

The diversity score is the number of areas in which a full unit or more of vocational credit was earned. Eight percent had less than a full unit of credit in a single area. Thirty-eight percent had a diversity score of 1, twenty-seven percent had 2, 14 percent had 3, nine percent had 4, five percent had 5 to 7 vocational areas represented.

The continuity score is the number of grade levels in which a vocational specialty was pursued. Seventeen percent had no specialty. Thirty-three percent had studied their specialty for one year, 34 percent for two years, and 16 percent for three years.

A supportive diversity score is the number of nonspecialty credits that are taken that were considered to be career-related to the specialty as judged by NCRVE. For example, in agriculture, accounting, bookkeeping and typing, courses were judged to be related. In this case, the specific courses that NCRVE considered supportive were broadened to include clerical, secretarial and marketing as supportive courses. Sixty-five percent of the students did not have supportive courses. Twenty-three percent had one supportive class, nine percent had two supportive classes, and three percent had three or four supportive classes.

The final measure used by NCRVE is proximity. A proximity score of 3 is awarded for a vocational specialty taken in both 11th and 12th grades, 2 points for credits in only 12th grade, 1 point for credits in only 11th grade, and 0 for all others. In Oregon, 19 percent of the vocational students got a score of 0, five percent a 1, 33 percent a 2, and 43 percent a 3.

Using cluster and discriminant analysis techniques, NCRVE researchers combined five concept scores to develop the following patterns of participation in vocational education. These procedures have also been applied in analyzing data from the National Longitudinal Study of High School Graduates. Vocational education students were grouped into five patterns of participation: concentrators, limited concentrators, concentrator/explorers, explorers and incidental.

FINDINGS

This section begins with a summary of findings followed by a closer look at the patterns of participation in vocational education. Highlights of findings from the former high school students are organized around five clusters: current status, career goals, postsecondary education, high school vocational education, and mathematics and science.

Current Status

- Sixty-six percent of the vocational education and 62 percent of the nonvocational graduates were working full or part-time.
- Thirty percent of the vocational and 41 percent of the nonvocational graduates were enrolled in school.
- Seven percent of all the graduates were not employed but seeking work.

- Vocational graduates were most commonly employed in marketing, health and service occupations; nonvocational graduates were most commonly in professional, marketing and service occupations.

- Male vocational graduates were earning $1.91 more per hour than male nonvocational graduates ($8.22 versus $6.30); female vocational graduates were earning $.14 less per hour than nonvocational graduates ($4.89 versus $5.03).

- Significantly, more vocational than nonvocational graduates had worked in their present job for over 30 months.

- Over 90 percent of the graduates were satisfied with their present job.

Career Goals

- Eighteen percent of the graduates were still undecided about their career goals.

- Thirty-one percent of the vocational and 21 percent of the nonvocational students made a career choice during high school years.

- Career choices were most often influenced by changing interests, work experiences and the influence of parents or friends. Career interest surveys and career education class materials were seldom identified as influencing career goals.

Postsecondary Education

- Seventy-six percent of the vocational graduates and 78 percent of the nonvocational graduates have attended postsecondary education.

- Thirty percent of the vocational graduates and 30 percent of the nonvocational graduates in school were attending Oregon community colleges.

- Four percent of the vocational graduates and 5 percent of the nonvocational graduates were enrolled in liberal arts.

- Business and health were the two most common vocational majors.

- Students enroll in postsecondary education most frequently to receive a degree, obtain a broad education, and to obtain or improve job-related skills.

- Half of the students were very satisfied with their postsecondary education and only 10 percent were unsatisfied.

- Over half of the students rated high school math and English as very helpful to their postsecondary education while over half rated foreign language as not helpful.

- Half of the vocational students rated their vocational courses as very helpful to postsecondary education and only 15 percent rated them as not helpful.

High School Vocational Education

- Vocational cluster students enrolled in vocational classes most frequently to prepare for a job and to explore different occupations. The majority of nonvocational students had the same expressed reasons plus the desire to try something new.

- Motivation to prepare for a job was particularly strong among female vocational students. The desire to try something new was especially true for nonvocational cluster males.

- Half of the nonvocational students had taken at least one semester of vocational cluster courses while in high school.

- Vocational students were most heavily concentrated in the areas of clerical, secretarial, accounting, metals, drafting and mechanical.

- Fifty-nine percent of the vocational students reported their current job to be closely related to their high school vocational courses.

- Approximately half of the students wished they had taken more vocational classes in high school while less than 5 percent wished they had taken fewer such classes.

- Aspects of vocational classes rated highest by students were the quality of instruction, hands-on applications, teaching of technical skills and the depth of content.

- Rated lowest by students were information about vocational programs available after high school and articulation with related community college classes.

Math and Science

- A third of the students recommended requiring three years of math for high school graduation; 26 percent of the vocational and 39 percent of the nonvocational students recommended a four year requirement.

- Twenty percent recommended a three year science requirement and 10 percent recommended four years.

- Sixty percent of the vocational students and 52 percent of the nonvocational students wished they had taken more math while in high school.

- Thirty-eight percent of both groups wished they had taken more science classes.

- Vocational students averaged 2.4 years of math while nonvocational students averaged 2.9 years.

- Vocational students averaged 1.9 years of science while nonvocational students averaged 2.4 years.

- In comparison with national averages, a larger proportion of Oregon students took General Mathematics and less took Algebra 1.

- Biology is the science course most frequently taken followed by physical science and chemistry. Nonvocational students were more likely to take chemistry, geology, physics and advanced biology.

- While the quality of science instruction and depth of content were rated high, about 40 percent rated the relevance of science to their job as poor.

Patterns of Participation

Table 1 indicates the percentage of students in each pattern of vocational participation from the 1979 and 1980 National Longitudinal Survey New Youth Cohort (Campbell, Orth and Seitz, 1981). Compared with the national sample, Oregon has less concentrators, concentrator/explorers and incidental but more limited concentrators and explorers.

TABLE 1
COMPARATIVE DISTRIBUTION OF VOCATIONAL STUDENTS IN THE NATIONAL LONGITUDINAL SURVEY (NLS) AND THE OREGON STUDY

	Percentage	
	NLS (N=3054)	Oregon (N=592)
Concentrator	14	5
Limited concentrator	23	39
Concentrator/explorer	13	5
Explorer	2	19
Incidental	48	32

The percentage of male and female vocational cluster and nonvocational cluster students who were classified into each profile is shown in Table 2. The highest percentage of the concentrators and limited concentrators are vocational cluster males.

TABLE 2

PERCENTAGE OF GRADUATES IN EACH VOCATIONAL PATTERN

	Vocational Cluster Graduates		Nonvocational Cluster Graduates	
	Males (N=304)	Females (N=342)	Males (N=333)	Females (N=275)
Concentrator	6	4	1	0
Limited Concentrator	41	33	8	6
Concentrator Explorer	4	5	4	8
Explorer	15	22	12	13
Incidental	34	36	75	73

Table 3 shows the mean scores of the vocational students on the five concepts as organized by their pattern of participation profile. The scores are very similar to the National Longitudinal Study (NLS) patterns. For example, concentrators averaged six vocational credits over a three-year period in the NLS study and 5.6 vocational credits over a three year period in the Oregon study. Explorers in both studies took courses in three or more different areas but did not achieve any level of specialization.

TABLE 3

MEAN PROFILE SCORES OF VOCATIONAL CLUSTER STUDENTS ON PROGRAM PARTICIPATION CHARACTERISTICS

	Concentrator (N=32)	Limited Concentrator (N=242)	Concentrator Explorer (N=30)	Explorer (N=121)	Incidental (N=222)
Intensity	5.6	3.1	1.6	0	.7
Diversity	1.3	1.8	2.4	3.9	1.1
Continuity	2.9	2.1	2.0	1.0	.8
Supportive Diversity	.3	.5	1.0	.9	.2
Proximity	3.0	2.8	1.6	1.4	1.3

It is interesting to see the way in which these five patterns of participation are distributed across the cluster areas. As shown in Table 4, some programs like agriculture, electrical and metals are heavily loaded with concentrators and limited concentrators while others like child care are heavily loaded with explorers and incidentals.

TABLE 4

NUMBER OF PARTICIPANTS AT VARIOUS LEVELS OF PARTICIPATION IN EACH VOCATIONAL CLUSTER AREA

	Concentrator	Limited Concentrator	Concentrator Explorer	Explorer	Incidental
Agriculture	3	10	1	1	3
Marketing	0	24	3	20	16
Health	0	5	1	4	11
Food Service	0	2	0	2	9
Accounting	4	21	2	20	32
Clerical	4	41	6	14	34
Secretarial	9	26	6	14	15
Mechanical	1	20	5	5	14
Construction	3	20	1	2	11
Electrical	4	15	0	3	4
Metals	2	27	0	7	10
Child Care	1	8	1	13	11
Clothing	0	1	1	1	0
Drafting	0	0	0	2	1
Graphics	0	8	0	3	9
Service	1	1	0	0	7
Forestry	0	3	0	0	0

The same five profiles were applied to the analysis of student participation in vocational organizations. As shown in Table 5 organizations like FFA draw almost exclusively on concentrators and limited concentrators while DECA and FBLA have a range of patterns represented.

TABLE 5

NUMBER OF STUDENTS IN VOCATIONAL ORGANIZATIONS SHOWN BY THEIR LEVEL OF PARTICIPATION IN VOCATIONAL EDUCATION

	Concentrator	Limited Concentrator	Concentrator Explorer	Explorer	Incidental
DECA	0	17	0	10	9
FBLA	6	20	2	7	3
FFA	3	7	0	0	1
VICA	1	13	1	1	16
HOSA	0	3	0	1	2

Using NCRVE's five classifications of vocational students, differences these groups displayed on certain outcome measures were examined by using only the 302 former state-certified vocational cluster high school students who are currently working full time. An analysis of

variance for the 302 former students indicated significant differences ($F=4.72$, $p < .01$ between these levels of vocational students in terms of their rating of how helpful they felt their high school education was in preparing them for their present job. The concentrators had significantly higher ratings on this outcome than did the other four groups as shown by a Duncan multiple range test ($p < .05$). The other four groups were not significantly different from each other. The same pattern of results occurred but with even higher levels of significance ($F = 17.9$, $p < .001$) when the questions focused more specifically on how useful high school vocational courses were in preparing them for their present job. Again, the concentrators felt their vocational courses were significantly more useful than did the other groups.

A second set of comparisons was run for vocational cluster students currently attending postsecondary school full time. The analysis of variance indicated significant differences among groups ($F = 6.87$, $p < .001$) when they rated the usefulness of their high school vocational education courses to their current education. Again the concentrators rated the usefulness of the high school vocational courses significantly higher than the other groups.

DISCUSSION AND RECOMMENDATIONS

Approximately three-quarters of the young people in this study reported attending some form of postsecondary education sometime during their three years since high school. The percentage was about the same for both former vocational and nonvocational students. This figure is higher than in previous studies which have looked only at young people currently enrolled in formal educational programs. In future years, it is likely that an even larger percentage of graduates will attend some form of education beyond high school. A key implication is that high schools should aim to prepare all students to be successful in education beyond high school, not simply those considered to be academically oriented.

The myth that high school students enroll in vocational education to avoid taking courses in math and science seems to be destroyed by the findings. For example, vocational students in this study took only a half unit less of math as nonvocational students (2.4 versus 2.9 credits), received about the same grades (2.5 versus 2.6) and wished they had taken more math in high school (60 percent versus 52 percent). A difference does occur, however, in the type of math taken.

For example, only four percent of the vocational students took calculus while 10 percent of the nonvocational students took it; and 21 percent of the vocational students took pre-algebra while only 15 percent of the nonvocational students took that course. We recommend that greater attention be given in high school to applying math in the vocational classes and to using some work-related applications in the math classes. Some courses, especially in the electronics area, might allow both math and vocational credit.

Vocational courses were perceived as useful not only by students considered "vocational cluster" students but also by nonvocational

students who took them. This suggests that greater attention be given to the benefits of nonvocational students enrolled in vocational education. A common criterion traditionally applied to secondary vocational programs has been the proportion of vocational graduates who entered jobs directly related to their area of training. This may no longer be an appropriate criterion since labor market changes greatly influence the number of people able to enter certain jobs. In this study the students considered "vocational concentrators" showed the greatest relationship between their training and their current job.

Two areas of vocational education rated the lowest by students were the provision of information about vocational programs available after high school and the coordination of high school courses with related community college classes. These weaknesses have also been cited by secondary teachers. This suggests the need to provide better information to the high school teachers and counselors so they in turn can share it with students. Periodic meetings between secondary and postsecondary staff would also help to encourage this understanding and provide a basis for joint planning of programs.

It is important to recognize the limitation of grouping all vocational students into the same mold. Some take six vocational credits in a single concentration over a three-year period. Others take courses in three or more different areas without having a specialty. It would be illogical to expect the same outcomes from both types of students. Thus, it is strongly recommended that future research studies look closely at outcomes based on students' patterns of participation in vocational education.

Schools need to allow time for staff and administrators to discuss their local follow-up study; compare local, district and statewide findings; and identify implications for improving vocational education and other areas of the curriculum.

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